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lized with solidifying agents such as cement or asphalt. The cement or asphalt is in a structurally stable form which can then be sent to a disposal facility.

Short-Lived Low-Level Radioactive Waste

Medical facilities produce both solid and liquid low-level radioactive waste, but some of their wastes have short half-lives. That is, they decay quite quickly. These wastes are stored in a container at the hospital until they decay. (The actual storage time depends on the half-life of the radioactive materials present.) After the wastes are analyzed for radioactivity to confirm that they have decayed, they can be disposed of as ordinary trash. This method of handling low-level waste is called storage for decay. It reduces the volume of waste to be sent to a low-level waste disposal facility.

Waste Treatment Implementation by Generators

Low-level radioactive waste stability requirements and the rapidly rising cost of disposal have encouraged widespread treatment of waste and substantial reductions in volume. In 1981, 2,960,000 cubic feet of commercial low-level radioactive waste were accepted for disposal in the United States. Ten years later, in 1991, the amount of waste accepted for disposal had declined 54% to 1,369,303 cubic feet.

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Department of Human Services
MAINE RADIATION
CONTROL PROGRAM

ADVISORY COMMISSION ON RADIOACTIVE WASTE & DECOMMISSIONING NEWS

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Special points of interest:

- Low Level Radioactive Waste and Materials in Maine
- Decommissioning of Maine Yankee Atomic Power Plant
- Radioactive Waste Management
- High Level Radioactive Waste

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DOME DEMOLITION

Overall demolition of the containment dome has started and is expected to continue for about another year and a half.

Demolition of the Interior has been underway for some time now and exterior work will start soon and proceed on a parallel path.

About 1/2 million pounds of concrete have been demolished and is being used for equipment ramps. This concrete will also be disposed of as soon as it's use is complete.

Removal of the interior concrete will be down to the steel liner or Neutron Shield Tank (NST). The NST and interior walls will be cut up and removed later this year. NST pieces will be shipped out in shielded rail cars for disposal at a special landfill. Once these tasks are complete, remediation and Final Site Surveys inside containment may begin.

Backfilling of the containment basement is the last step before shell demolition is complete. The shell is a very strong structure and the largest on site. It will not be an easy task to demolish with its 4.5 foot thick reinforced concrete.

Maine Yankee plans to demolish the shell and liner by use of explosives to maximize safety and reduce noise impact and demolition duration.

To prepare for use of explosives they plan to start cutting nine 80 feet high rectangles in the containment shell this summer. They estimate that his work will take about a year.

Commission Members

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Jim Mitchell, Public

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All meetings of the Advisory Commission are open to the public. The commission meets 4-6 times a year to discuss and review LLW and decommissioning issues. Meeting dates can be found at our website or call Tom Hillman at 207-287-8401 for the next meeting time or to be placed on the meeting notification list.

Cesium 137 in Scrap Loads

Ray Turner of the David J. Joseph Company of Ohio produced a report on radioactive sources in scrap loads. Recent tests using Cs137 sources buried at varying distances in truckloads of not-so-dense scrap metal show that beyond short distances the Cs is undetectable.

A 15 mCi Cs137 source buried was used for the test. When the Cs was moved more than 22 inches, in most cases, it became impossible to detect using large plastic scintillation systems.

Similarly, in an actual event, a truckload of scrap metal reached a steel mill and tripped the large volume detector. The background radiation levels were at 15uR/hr and the highest reading outside the truck was 17uR/hr. While this seemed like an over-reaction to a very sensitive system, a consultant was summoned to the site. After surveying all the scrap in the load, he found not one, but two Cs137 devices inside the load. One was emitting 75 mR/hr while the other emitted 125 mR/hr.

These lessons learned serve as a reminder that, when a large volume system detects radiation, just because there is little radiation detected outside the vehicle, no assumptions should be made other than there is radioactive material in the load.

Additionally, since the advent of NORM regulations exempting oil and gas NORM, there is an increasing number of railroad cars that are becoming contaminated with Ra226 as it sifts in small amounts to the bottoms of the railroad cars. Eventually, the build-up reaches the point that it trips detection systems, even at low levels. Some state radiation control officials are becoming increasingly aggravated with such trivial levels of radiation that ends up coming from the soil. The general consensus is that the systems are overly sensitive. Given the limitations of currently installed large volume systems, coupled with a single accidental melting of an orphaned source in a steel mill, it is very easily understood why steel mills and recyclers must take every precaution necessary to prevent multi-million dollar contaminating events.

Maine does not have regulation requiring or enforcing monitor as a few other states do. Pennsylvania requires all landfills and scrap metal yards to have monitors on site.

Currently a few are in use in this state. Maine Yankee and Maine Energy Recovery Corporation currently have monitors in place to check loads of waste.

How Is Low-Level Radioactive Waste Treated ?

Before low-level radioactive waste can be transported or placed in a disposal facility, it must be in an acceptable form. Regulations require that the waste be solid and structurally stable so that it can be transported more safely and does not settle after being placed in a disposal facility. When the waste meets these requirements, the risk of human exposure to radiation is reduced.

Low-level radioactive waste is generated in many forms. Some of it is solid, and some is liquid. Very little of it is structurally stable. Therefore, the waste must be treated to convert it to an acceptable form for disposal.

In addition, low-level radioactive waste is treated to reduce its volume as much as possible before disposal. Minimizing the volume reduces both the size of the disposal facility required and the cost of waste disposal. It should be noted that while treatments can reduce the volume of low-level waste, the amount of radioactive material present remains essentially unchanged.

This fact sheet describes the treatment methods used for the various forms of low-level radioactive waste.

Solid Low-Level Radioactive Waste

Most of the low-level radioactive waste generated by nuclear power plants, industry, hospitals, and research institutions is in dry, solid form such as cardboard, paper, plastic, cloth, and glass. To reduce the amount of space required to store the low-level waste, three processes are used to reduce its volume: compaction, incineration, and shredding.

Compaction involves compressing the waste to reduce its volume, much like a kitchen trash compactor. Compaction is a relatively inexpensive and widely available option which is used by many low-level radioactive waste generators.

Originally used to treat municipal solid waste, incineration can be used to reduce the volume of solid low-level radioactive waste. When any material is incinerated, the products are gases and ash. When radioactive material is incinerated, the gas and ash contain radioactive particles and must be treated. The gas is filtered to remove radioactive particles. The filters become contaminated and must be treated as radioactive waste. The ash is mixed with concrete or other material to prevent radioactive particles from blowing away.

Usually both compaction and incineration are performed in conjunction with shredding. Shredding involves cutting solid low-level radioactive waste into smaller pieces. This allows for more efficient compaction and a more uniform burn for incineration.

It should be noted that nuclear power plants, industry, hospitals, and research institutions also generate non-radioactive solid waste. Any non-radioactive trash that is put in a container with radioactive waste must be treated as radioactive waste because it might have become contaminated. One way to reduce the volume of low-level radioactive waste to be treated is to keep non-radioactive trash segregated from radioactive waste. While segregation is not a "treatment" of low-level waste, it is a way to reduce the volume.

Another source of low-level radioactive waste is contaminated equipment. If a piece of equipment used in a contaminated area is no longer needed there, it can either be disposed of as low-level waste or decontaminated and used in other, uncontaminated areas. Decontamination is the process of removing radioactive material from all interior and exterior surfaces of the equipment. While decontamination often requires a significant amount of time and can cause some exposure to workers, it can reduce the volume of low-level waste that must be disposed of.

Liquid Low-Level Radioactive Waste

Liquid low-level radioactive waste is generated primarily by nuclear power plants during purification of cooling water. Lubrication oil and sludges from filters are other examples of liquid low-level waste.

Liquid low-level radioactive waste must be solidified for transportation and disposal. Usually, as much water as possible is removed from the liquid waste, and the remaining material is immobilized. Methods for removing water include evaporation and filtration. The remaining material is immobi-